

# Wisconsin's Commercial Trawl Harvest 2003

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## INTRODUCTION

Wisconsin's commercial fishing industry typically utilizes three types of gear on Lake Michigan: gill net, entrapping nets and trawler. This report focuses on the commercial trawling industry and utilizes the harvest information submitted by the commercial fisherman for rainbow smelt *Osmerus mordax*, bloater chub *Coregonus hoyi* and alewife *Alosa pseudohargus*.

Historically, commercial trawling has targeted three main species of fish in the Wisconsin waters of Lake Michigan. Much of the harvest was a general forage catch that was utilized by the pet food market. This type of trawling caught large numbers of fish, chiefly alewife, rainbow smelt, and bloater chub. The catch from 1983 to 1990 ranged from 9,547,528 to 25,757,452 pounds and was dominated by alewife (Peeters 1991). The other portion of the trawl fishery was a targeted rainbow smelt harvest used for the human food market. The targeted harvest of rainbow smelt peaked in 1990 at 1,834,014 pounds, and has since declined.

During 1991 additional rules regulating trawling in the waters of Lake Michigan and Green Bay were adopted. These rules were designed to allow the harvest of rainbow smelt, eliminate general forage catches and established a Total Allowable Commercial Harvest (TACH) for rainbow smelt. The regulations also restricted the areas, dates, and times fished to establish a daylight, deep water (depths greater than 60 feet) Lake Michigan fishery from November 15 to April 20, and a nighttime, deep water (depths greater than 65 feet) Green Bay fishery from June 15 to September 30 (Figure 1). The TACH for rainbow smelt, effective license year 2000 is 1 million pounds annually, of which no more than 351,993 pounds can be caught in Green Bay.

This report builds on earlier reports from Peeters (1989, 1991, and 1992) and Surendonk (1993, 1996, 1997, 1998, 1999 and 2000). Further, it summarizes trawl harvest from Lake Michigan and Green Bay for calendar year 2002 and license year 2003 as described in Wisconsin Administrative Code N.R. 25.9 (2)(d).

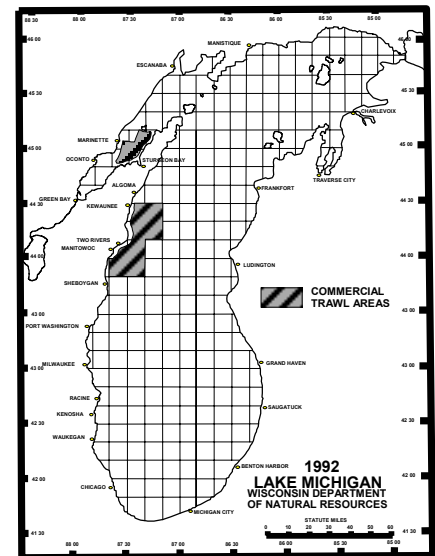


Figure 1. Permitted commercial trawling grounds.

## METHODS AND RESULTS

Trawl harvest information was obtained from the mandatory biweekly catch forms submitted by commercial license holders during the statutory season. This report examines reported harvest data two ways, on a calendar year and license year basis. Calendar year harvest is reported for historical comparison and license year harvest is presented to examine quota harvest since new rule changes were established in license year 1992.

Unsorted catch harvest, as defined in this report, includes incidentally caught fish which were landed and not discarded offshore as dead scrap or reported as processed bloater chub. Incidental (unsorted) catch is mostly bloater chub but also includes other species not limited to alewife and smelt.

### **Calendar Year 2002** (January 1,2002- December 31,2002)

In calendar year 2002, trawlers reported harvesting a combined total of 294,832 pounds of rainbow smelt from Lake Michigan and Green Bay (Figure 2, Table 1). The total rainbow smelt harvest in 2002 was similar to harvest in calendar year 2000 and 2001.

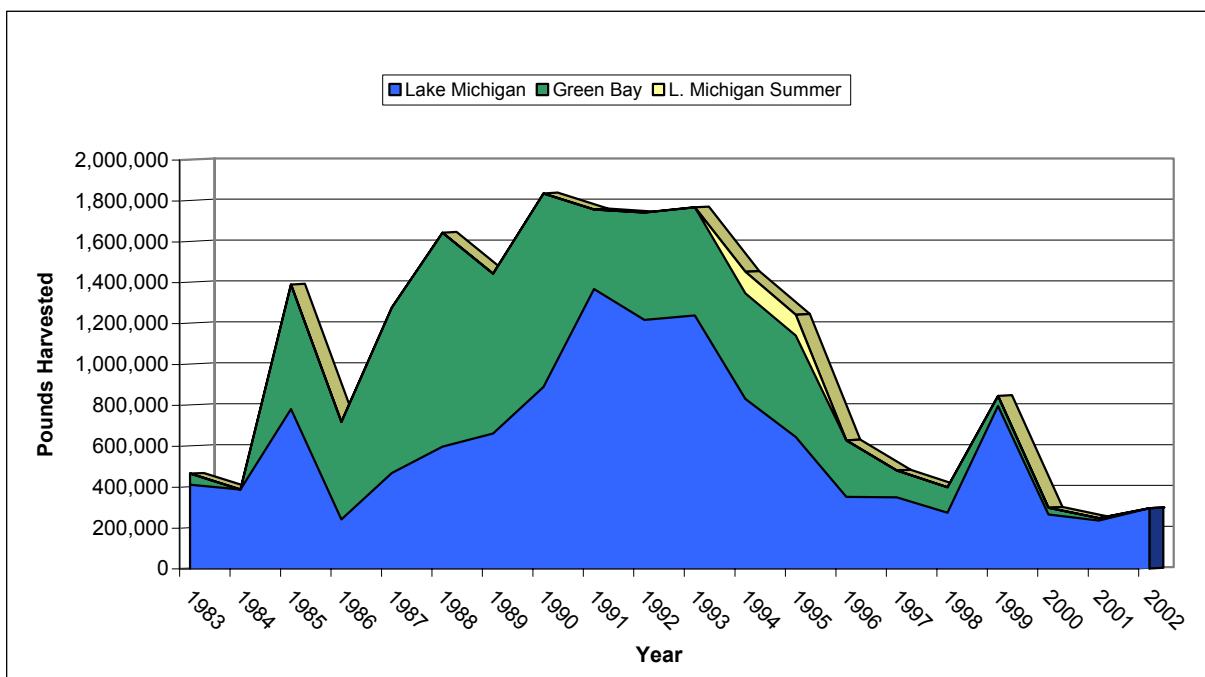


Figure 2. Calendar year reported harvest of rainbow smelt from Lake Michigan and Green Bay from 1983 through 2002 by commercial trawl.

## Lake Michigan

The 2002 calendar year rainbow smelt harvest from Lake Michigan was 294,541 pounds. Trawlers fished for 1,701 hours with a catch per effort (CPE) of 173 pounds per hour trawled (Figure 3, Table 1). The Lake Michigan harvest was near the 2001 harvest and CPE increased 32 percent from the 2001 level but was still relatively low historically.

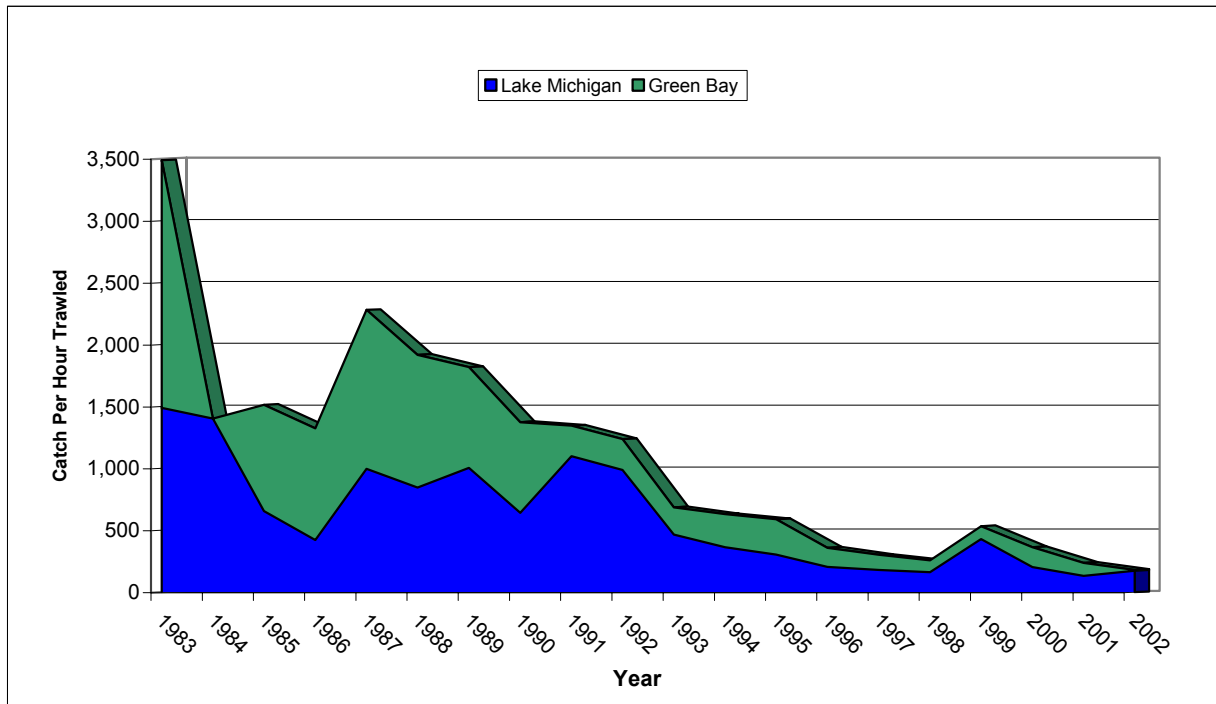


Figure 3. Calendar year reported catch per effort of rainbow smelt, by commercial trawl, from Lake Michigan and Green Bay from 1983 through 2002.

## Green Bay

On Green Bay, trawlers reported harvesting only 291 pounds of rainbow smelt during calendar year 2002. Trawlers fished for 43 hours with a CPE of 7 pounds per hour trawled during calendar year 2002 (Figure 3, Table 1). The Green Bay harvest was the lowest since 1983, 98 percent lower than the 2001 harvest and CPE decreased 94 percent from the 2001 level.

**License Year 2003**  
(July 1,2002 - June 30,2003)

In license year 2003, trawlers harvested a combined total of 77,448 pounds of rainbow smelt from Lake Michigan and Green Bay (Figure 6, Table 2). License year 2003 harvest decreased 76 percent from the 2002 harvest and was 96 percent lower than the 1992 license year harvest, the first license year affected by the quota system. The 2003 license year harvest was the lowest since the current season structure was implemented in 1992.

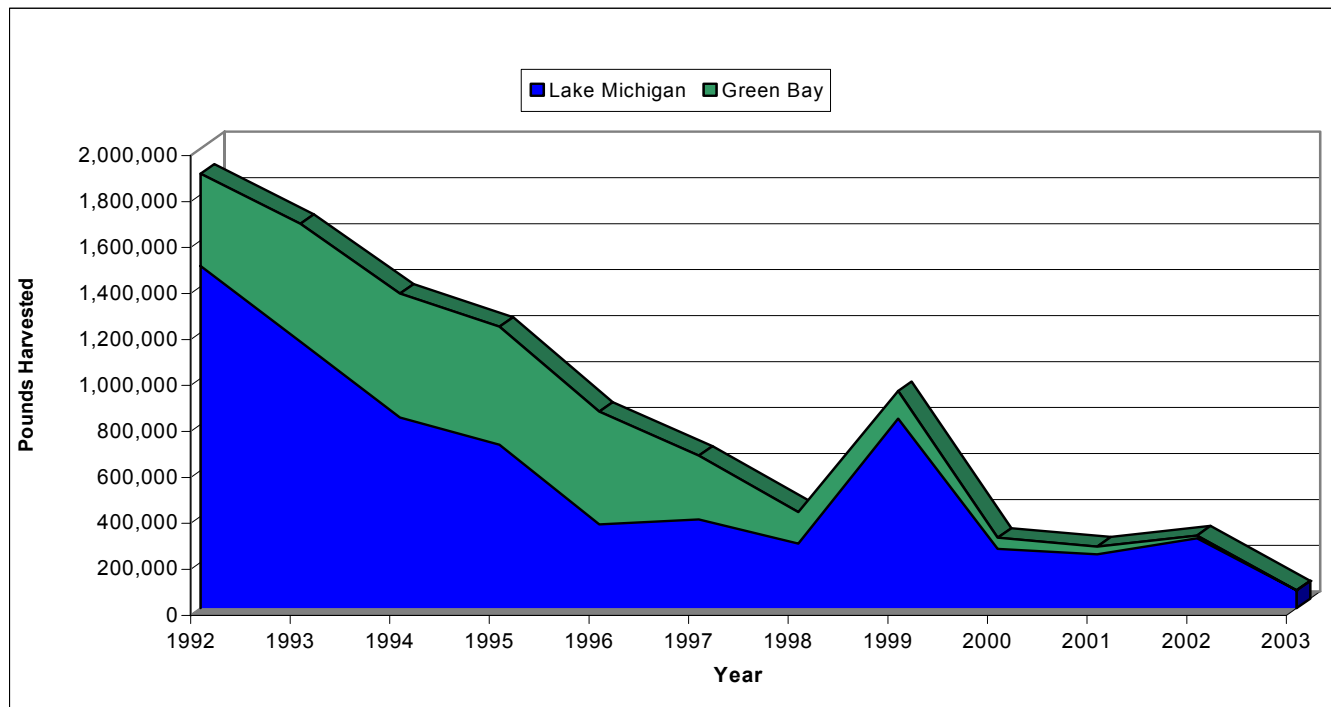


Figure 6. License year reported harvest of rainbow smelt from Lake Michigan and Green Bay from 1992 through 2003 by commercial trawl.

### Lake Michigan

The 2003 license year rainbow smelt harvest from Lake Michigan was 77,185 pounds. Trawlers fished for 1,081 hours with a CPE of 71 pounds per hour trawled (Figure 7, Table 2). The 2003 harvest was 75 percent lower than the 2002 harvest and 95 percent lower than the 1992 license year harvest. The 2003 license year harvest was the lowest since the current season structure was implemented in 1992. Hours trawled have decreased 37 percent from 2002 and decreased 19 percent from the 1992 license year. The CPE has decreased 60 percent from 2002 levels and decreased 94 percent from the 1992 license year.

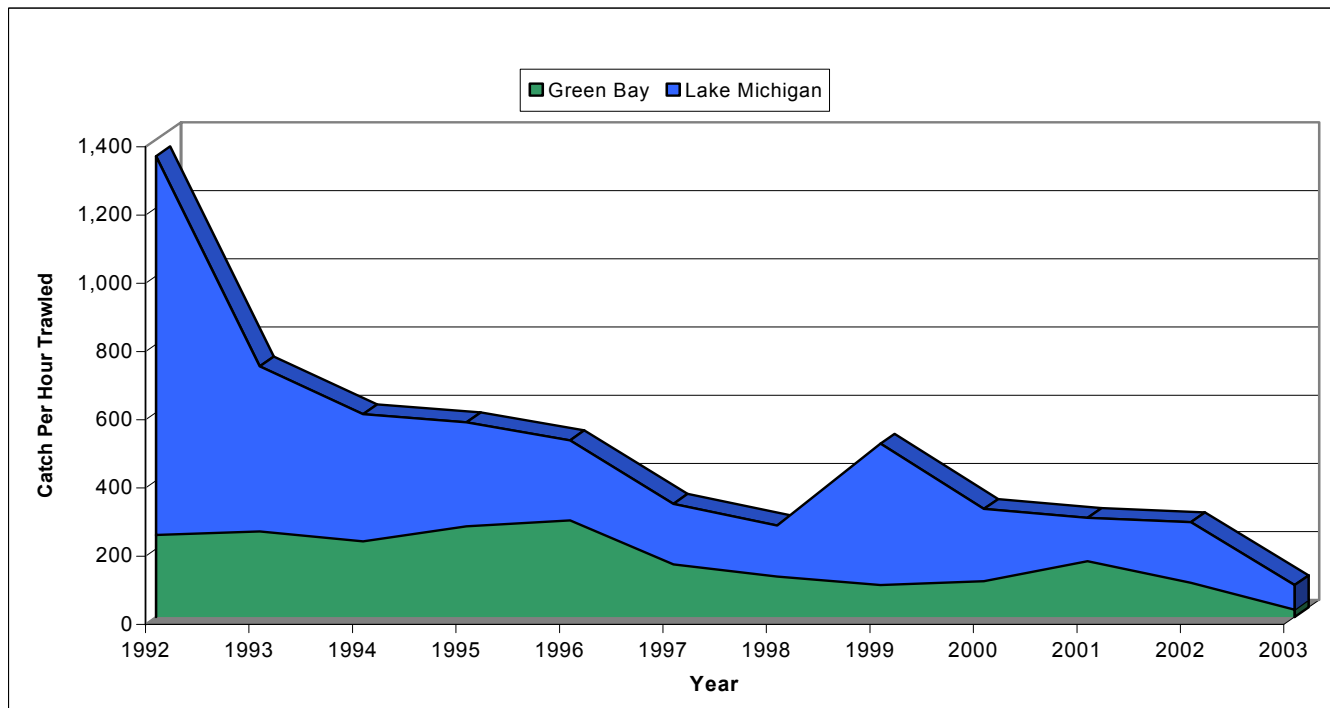


Figure 7. Reported catch per effort of rainbow smelt by commercial trawl, from Lake Michigan and Green Bay from license year 1992 through 2003.

Additionally, the trawlers reported harvesting 14,160 pounds of bloater chub which were processed for their flesh or roe and 79,155 pounds of unsorted catch, consisting mainly of small bloater chub and 112,302 pounds of alewife (Figure 8, Table 3).

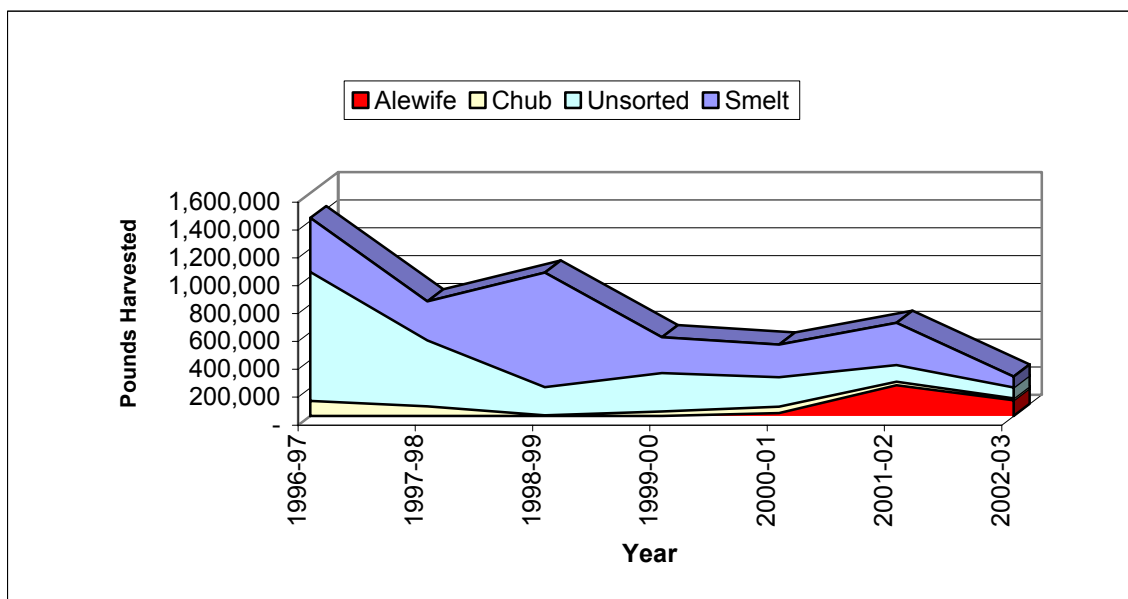


Figure 8. Reported smelt harvest and bycatch from Lake Michigan by commercial trawl from license year 1996 through 2003

## Green Bay

The 2003 license year rainbow smelt harvest from Green Bay was 263 pounds. Trawlers fished for 12 hours with a CPE of 22 pounds per hour trawled (Figure 7, Table 2). The license year harvest was 98 percent lower than the 2002 harvest and 99 percent lower than the 1992 harvest. The 2003 license year harvest was the lowest since the current season structure was implemented in 1992. Hours trawled have decreased 90 percent from 2002 and have decreased 99 percent overall from the 1992 license year. CPE decreased 78 percent from the 2002 level and decreased 91 percent from the 1992 license year. Additionally, trawlers reported harvesting 19 pounds of alewife.

## DISCUSSION

Reported harvest figures used throughout this report were obtained from commercial catch reports submitted by commercial fisherman. Frequently all that is reported is the poundage of saleable rainbow smelt sorted from the catch for human consumption. At times, the incidental catch of rainbow smelt too small for the human consumption market can be substantial. Peeters (1991) indicated the discrepancy between monitored and reported CPE might be the result of sorting for marketable fish with the remainder being reported as unsorted catch or returned dead to the water as scrap.

The declines in harvest and CPE appear to be independent of the regulatory changes enacted in 1992, and may be an indicator of an overall lakewide decline in rainbow smelt stock. Data collected by the Department of the Interior, U.S. Geological Survey Biological Resource Division (USGS) indicates that relative abundance and biomass of rainbow smelt (available to bottom trawl) has declined from 1992 levels (Madenjian et al 2003). The USGS data indicates a 95 percent decline in biomass of rainbow smelt between the years of 1992 and 2002 (Figure 9).

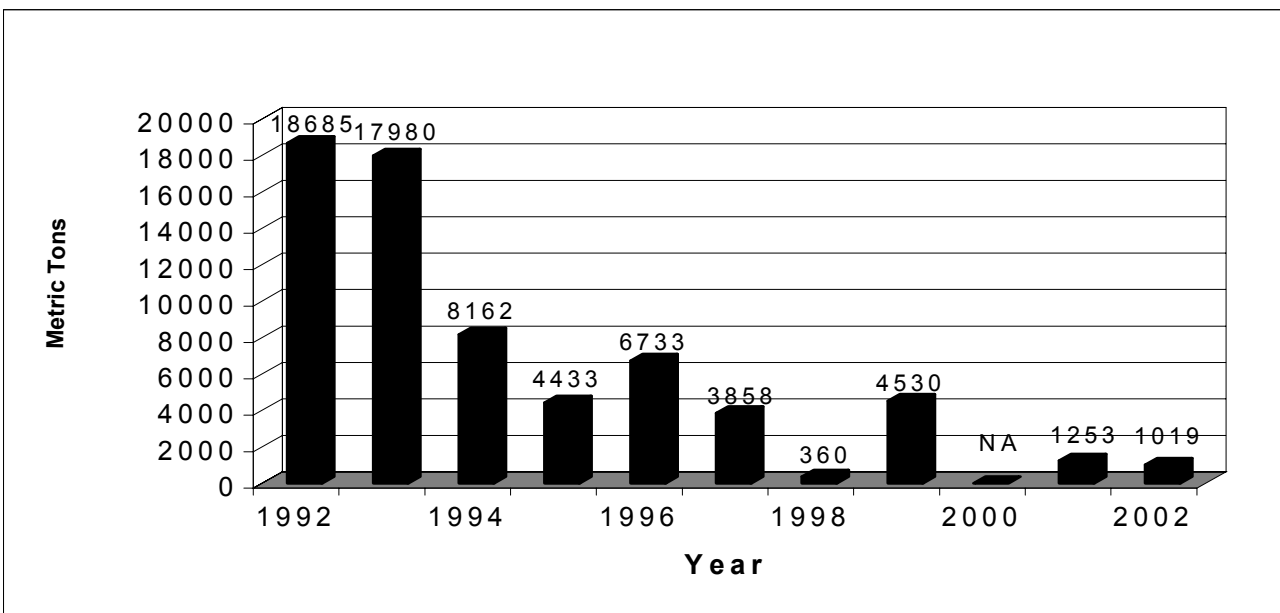


Figure 9. United States Geological Survey estimated biomass of rainbow smelt in Lake Michigan 1992-2002, based on bottom trawl survey.

Lake Michigan smelt stocks showed no sign of rebound in the commercial trawl industry in license year 2003. Total harvest declined to a 12 year low of 77,185 pounds of smelt, a 87 percent decline off the 12 year average of 576,360 pounds. The industry fished for 1,081 hours in license year 2003 a decrease of 633 hours below license year 2002 and below the 12 year average of 1,810 hours trawled.

If smelt relative abundance is expressed in terms of Catch Per Hour of Trawl, license year 2003 was the lowest reported smelt abundance in 12 license years. The commercial trawl industry reported harvesting 71 pounds per hour in license year 2003, a 78 percent decline off the 12 year average of 320 pounds per hour trawl.

On Lake Michigan the trawling industry utilized 5 vessels in license year 2003. (Figure 10, Table 4).

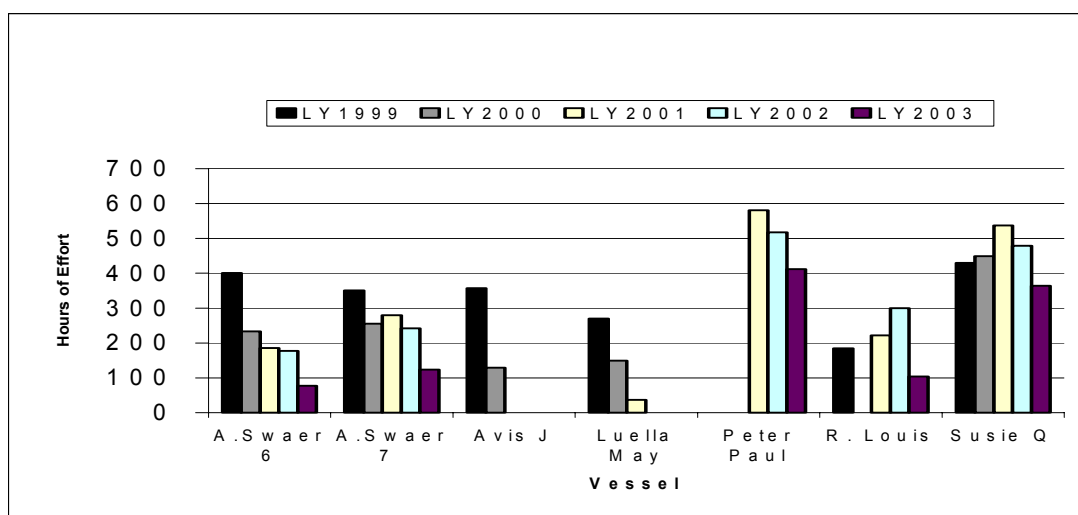
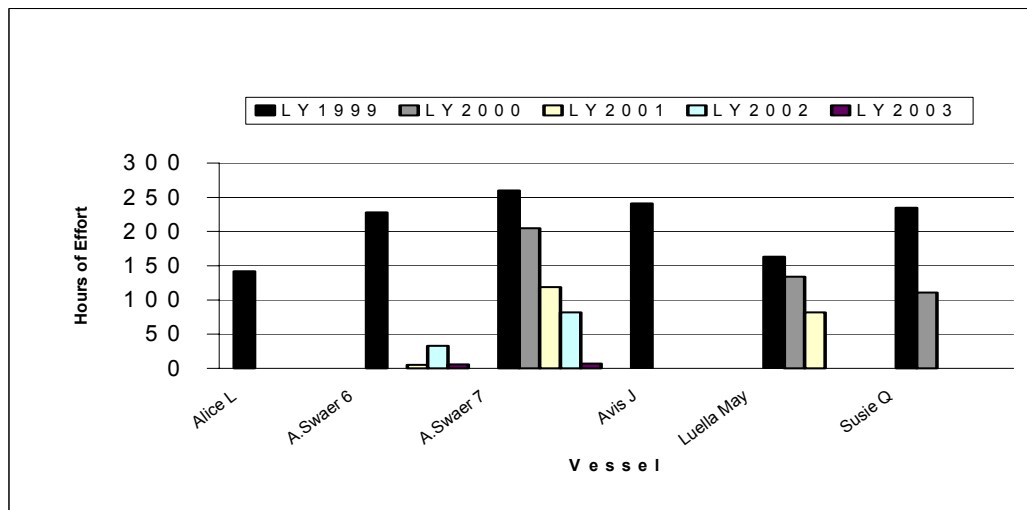


Figure 10. Reported trawl effort by vessel on Lake Michigan, license year 1999 -2003.

The status of the Green Bay smelt population is unclear. If smelt relative abundance were an expression of Catch Per Unit of Effort (CPE), license year 2003 suggests that the stock is at a historic low. However, low trawling effort and small sample size limits the data's value and it is likely misleading. The commercial trawl industry reported harvesting 22 pounds per hour of trawl in license year 2003. This is a 87% decline below the 12 year average of 169 pounds per hour trawl.

Total harvest declined to a 12 year low of 263 pounds of smelt which is greater than a 99 percent decline below the average of 257,349 pounds. The industry fished for 12 hours in license year 2003 a decrease of 103 hours from license year 2002 and 1225 hours below the 12 year average of 1,237 hours trawled.

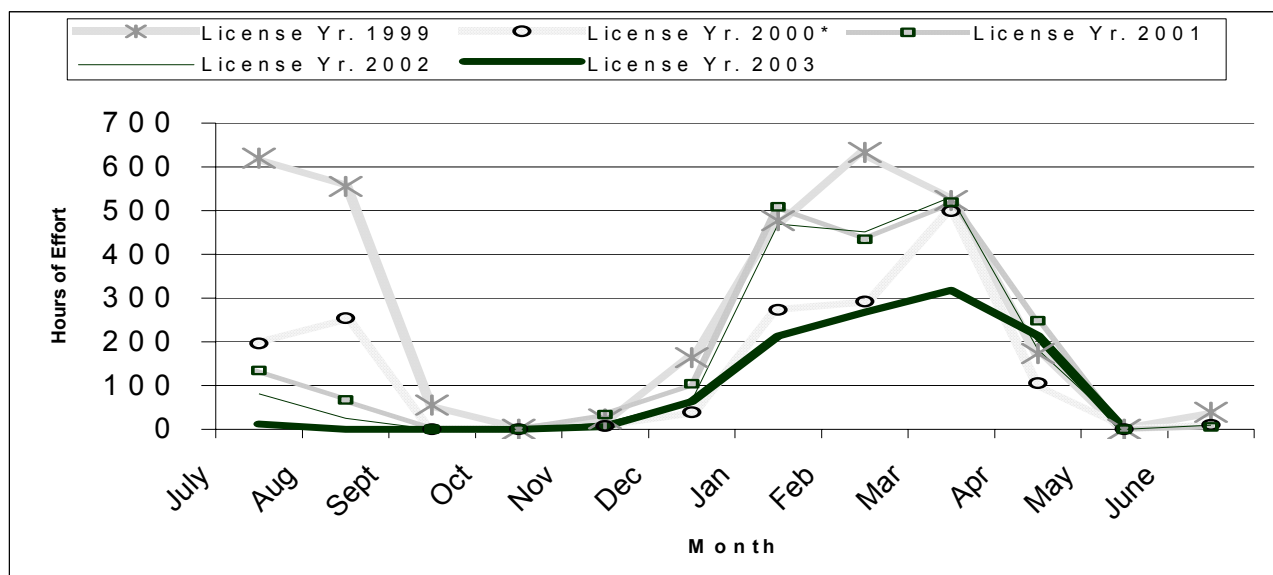
On Green Bay the trawling industry utilized 2 vessels in license year 2003 (Figure 11, Table 5).



\* Includes reported harvest up to April 20, 2003.

Figure 11. Reported trawl effort by vessel on Green Bay, license year 1999 -2003.

In license year 2003 trawling effort remained consistent until season closure on April 20<sup>th</sup>. However, the industry fished at a lower rate then seen in previous years. This continuous effort may be a reflection of the demand for smelt and bloater chub flesh and roe and the relatively high market prices for these products. The reduction of effort on Lake Michigan may be the result of both declining smelt and bloater chub biomass found in Lake Michigan. The decreased interest in trawling during the summer months on Green Bay may be due to low smelt abundance and the absence of marketable bicatch (Figure 12, Table 6).



\* Includes reported harvest up to April 20, 2003.

Figure 12. Reported trawl effort by month on Green Bay and Lake Michigan, license year 1999 -2003.



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Table 1. Reported rainbow smelt harvest and CPE for commercial trawling on Lake Michigan and Green Bay for calendar years 1983 through 2000.

Calendar Year*	Lake Michigan Harvest (lbs.) CPE**		Green Bay Harvest (lbs.) CPE**		Summer Study Harvest (lbs.)	Total Harvest (lbs.)
1983	408,928	1,489	54,990	2,000		463,918
1984	385,704	1,401	0	0		385,704
1985	779,618	654	609,454	860		1,389,072
1986	239,340	422	476,732	901		716,072
1987	467,245	996	808,775	1,284		1,276,020
1988	596,112	845	1,046,045	1,072		1,642,157
1989	660,890	1,004	781,171	814		1,442,061
1990	887,765	641	946,249	732		1,834,014
1991	1,366,419	1,099	389,440	246		1,755,859
1992	1,215,253	988	524,856	248		1,740,109
1993	1,237,106	465	529,560	220		1,766,666
1994	828,396	363	518,096	266	104,366	1,450,858
1995	642,324	304	496,744	284	101,716	1,240,784
1996	349,900	205	276,454	154		626,354
1997	347,696	180	131,229	121		478,925
1998	272,075	161	125,396	94		397,471
1999	794,151	429	50,588	104		844,739
2000	263,800	202	33,871	161		297,671
2001	234,505	131	11,665	105		246,170
2002	294,541	173	291	7		294,832

\*Calendar year runs from January 1 through December 31 of the same year.

\*\*CPE is reported as pounds/hour trawled.

Table 2. Reported smelt harvest, CPE, and effort for commercial rainbow smelt trawling on Lake Michigan and Green Bay for license years 1992 through 2003.

License Year*	Lake Michigan			Green Bay			Total
	Harvest (lbs.)	CPE**	Effort (hrs)	Harvest (lbs.)	CPE**	Effort (hrs)	Harvest (lbs.)***
1992	1,488,460	1,110	1,341	401,768	241	1,669	1,890,228
1993	1,158,984	484	2,395	512,788	251	2,041	1,671,772
1994**	829,724	373	2,223	538,859	222	2,430	1,386,115
1995**	710,510	305	2,330	513,894	266	1,929	1,353,592
1996	363,592	235	1,548	491,417	283	1,735	914,371
1997	386,521	178	2,168	276,431	154	1,800	662,952
1998	280,281	150	1,867	138,256	119	1,158	418,537
1999	824,286	414	1,992	120,843	94	1,291	945,129
2000	257,905	212	1,214	48,336	105	459	306,241
2001	234,680	127	1,843	33,715	164	206	268,395
2002	304,186	177	1,714	11,620	101	115	315,806
2003***	77,185	71	1081	263	22	12	77,448

\*License year runs from July 1 through June 30 of the following year.

\*\*CPE was calculated as pounds/hour trawled and does not include harvest and effort data from the Lake Michigan Summer Study 1994 and 1995.

\*\*\* Includes reported harvest up to April 20, 2003.

Table 3. Reported commercial bicatch on Lake Michigan, License Year 1999-2003.

	1997	1998	1999	2000	2001	2002	2003
Alewife					21,265	219,668	112,302
Chub	108,846	67,967	5,570	32,698	45,894	25,832	13,299
Unsorted Catch	926,348	474,523	200,385	275,503	212,186	120,272	79,155
Chub Egg/Gut		8,267	1,582	751	5,400	3,606	861

Table 4. Reported commercial smelt trawl effort by vessel on Lake Michigan, License Year 1999-2003.

	Lake Michigan hours of effort by License Year				
	1999	2000	2001	2002	2003
A.Swaer 6	401	233	186	177	77
A.Swaer 7	351	255	280	242	124
Avis J	357	129	0	0	0
Luella May	270	149	37	0	0
Peter Paul	NA	NA	581	517	412
R. Louis	185	0	222	300	104
Susie Q	430	449	537	479	364

Table 5. Reported commercial smelt trawl effort by vessel on Green Bay, License Year 1999-2003.

	Green Bay hours of effort by License Year				
	1999	2000	2001	2002	2003
A.Swaer 6	228	0	5	33	6
A.Swaer 7	260	215	119	82	7
Avis J	241	0	0	0	0
Luella May	163	134	82	0	0
Peter Paul	NA	NA	0	0	0

\* Includes reported harvest up to April 20, 2003.

Table 6. Hours of effort by month for Lake Michigan and Green Bay for license year 1999-2003.

Month	1999.	2000.	2001.	2002	2003*
July	620	196	134	81	12
August	555	254	67	25	0
September	55	0	0	0	0
October	Closed	Closed	Closed	Closed	Closed
November	24	7	33	15	6
December	164	39	104	66	63
January	477	273	509	469	213
February	633	292	434	451	268
March	523	499	518	531	318
April	173	105	248	182	214
May	Closed	Closed	Closed	Closed	Closed
June	39	10	5	9	Not Reported

\* Includes reported harvest up to April 20, 2003.